

1 56. (New) An apparatus according to Claim 25, further
2 comprising:

3 a display device;

4 wherein said image processing section being connected to said
5 display device and being further operative to:

6 save an identification of an event associated with said
7 detected object;

8 save one of the detected images as a reference image; and

9 display via said display device said reference image,
10 said path of movement of the object within said reference
11 image, and said identification of said event on said reference
12 image.

REMARKS

The claims are claims 1, 3 to 17, 22, 25 to 27, 29 and 40 to 56.

Claims 1, 15, 16, 17, 22, 25, 26, 27 and 29 have been amended. Claims 2, 18 to 21, 23, 24, 28 and 30 to 39 have been canceled. New claims 40 to 56 are added. Claims 1, 15, 16, 17, 22, 25, 26, 27 and 29 have been amended to distinguish over the cited references. New claims 40 to 54 correspond generally to respective claims 3 to 17 except they are dependent upon apparatus claim 22. New claims 55 and 56 correspond to respective claims 26 and 27 except they are dependent upon apparatus claim 29.

Claims 1, 3 to 17, 22, 25 to 27 and 29 were rejected under 35 U.S.C. 102(e) as anticipated by Courtney U.S. Patent No. 5,969,755.

Claims 1, 22, 25 and 29 recite subject matter not disclosed in Courtney. Claims 1 and 25 recite "saving the selected image of

each identified object; and discarding and not saving detected images other than said selected image of each identified object." Claims 22 and 29 similarly recite "save the selected image of each identified object; and discard and not save detected images other than said selected image of each identified object." Courtney states at column 5, lines 4 to 9:

"The system stores the output of the vision subsystem--the video data, motion segmentation, and meta-information--in the database 15 for retrieval through the user interface 17. The interface allows the user to retrieve a video sequence of interest, play it forward or backward and stop on individual frames."

This portion of Courtney fails to teach storing only selected images and discarding other images. The video playback provision of Courtney inherently requires storage of all the video frames. This application teaches at page 12, lines 25 to 31 storing only "selected information" to reduce the amount of data that needs to be stored. Accordingly, claims 1, 22, 25 and 29 are allowable over Courtney.

Claim 3 recites subject matter not anticipated by Courtney. Claim 3 recites the image selection process uses "image selection criteria which are intended to lead to the selection of an image in which the face of a detected person is visible and large." The Applicant respectfully submits that Courtney includes no teaching of attempting to detect a "visible and large" image of a person's face. Accordingly, claim 3 is allowable over Courtney.

Claim 4 recites subject matter not anticipated by Courtney. Claim 4 recites "selecting the selected image for the given change region by discarding images from the set in which a lowermost side of the bounding box is higher than in other images of the set, and by selecting from the remaining images of the set an image in which a size of the bounding box is larger than in the other remaining

images of the set." The Applicant respectfully submits that Courtney includes no teaching regarding the lowermost side or the size of a bounding box for a given change region. Accordingly, claim 4 is allowable over Courtney.

Claim 5 recites subject matter not anticipated by Courtney. Claim 5 recites the automatic selecting uses "image selection criteria which cause a current image to be selected over a prior image if a lowermost point of a detected change region is lower in the current image than in the prior image." The Applicant respectfully submits that Courtney includes no teaching regarding the lowermost point of a detected change region. Accordingly, claim 5 is allowable over Courtney.

Claim 6 recites subject matter not anticipated by Courtney. Claim 6 recites the automatic selecting uses "image selection criteria which cause a current image to be selected over a prior image if a detected change region has increased in size relative to a prior image." The Applicant respectfully submits that Courtney includes no teaching regarding the size of a detected change region. Accordingly, claim 6 is allowable over Courtney.

Claim 7 recites subject matter not anticipated by Courtney. Claim 7 recites "said selecting step is carried out in response to the occurrence of a predefined event." Courtney discloses detection of events. Courtney fails to disclose selecting which images to store based upon such a detected event. Accordingly, claim 7 is allowable over Courtney.

Claims 10, 13 and 14 recite events not anticipated by Courtney. Claim 10 recites "an object has remained within a predefined region of the area for a specified time interval." Claim 13 recites "a determination of whether a detected object is a person." Claim 14 recites "for a detected object which is not a person, classification of the detected object into one of a plurality of predetermined categories." While Courtney teaches

detection of events within the video sequence, Courtney fails to teach these events. Accordingly, claims 10, 13 and 14 are allowable over Courtney.

Claim 15 recites subject matter not anticipated by Courtney. Claim 15 recites "determining a bounding box with just large enough to completely contain the detected object and saving a portion of a detected image which includes the detected object corresponding to the bounding box." Courtney fails to teach saving a portion of a detected image using a bounding box. Accordingly, claim 15 is allowable over Courtney.

Claim 16 recites subject matter not anticipated by Courtney. Claim 16 recites "saving the bounding box enclosing the selected image at a second resolution which is higher than the first resolution." Courtney fails to disclose storing image data at two differing resolutions. Accordingly, claim 16 is allowable over Courtney.

Claim 17 recites subject matter not anticipated by Courtney. Claim 17 recites "displaying the reference image at the first resolution, displaying the bounding box enclosing the selected image within the reference image at the first resolution, and displaying the bounding box enclosing the selected image separately from the reference image and at the second resolution." This subject matter is described in the application at page 19, lines 24 to 37, page 20, lines 20 to 29 and illustrated in Figure 8. Courtney fails to teach such display of the same image data in two resolutions. Accordingly, claim 17 is allowable over Courtney.

Claims 25 and 29 recite further subject matter not anticipated by Courtney. Claim 25 recites "automatically saving information which identifies the path of movement of the object, said information being retained after the object is no longer present in newly detected images." Claim 29 similarly recites the image processing section operates to "automatically save information

which identifies the path of movement of the object, and to retain the information after the object ceases to be present in current detected images." The Applicant respectfully submits that Courtney fails to teach saving this motion track information. Accordingly, claims 25 and 29 are allowable over Courtney.

Claims 26 and 27 recite subject matter not anticipated by Courtney. Claims 26 and 27 each recite "saving one of the detected images of the area as a reference image, displaying the reference image, and displaying on the reference image the path of movement of the object." Courtney fails to teach display of the path of movement on a reference image. Accordingly, claims 26 and 27 are allowable over Courtney.

Claim 27 recites further subject matter not anticipated by Courtney. Claim 27 recites "saving an identification of an event associated with the detected object" and "displaying on the reference image the identification of the event." Courtney does not teach displaying the identification of an event on a reference image. Accordingly, claim 27 is allowable over Courtney.

Claims 1, 3 to 17, 22, 25 to 27 and 29 were rejected under 35 U.S.C. 102(e) as anticipated by Seeley et al U.S. Patent No. 5,969,755.

Claims 1, 22, 25 and 29 recite subject matter not disclosed in Seeley et al. Claims 1 and 25 recite "automatically selecting a single image of each identified object using selection criteria; saving the selected image of each identified object; and discarding and not saving detected images other than said selected image of each identified object." Claims 22 and 29 similarly recite "automatically select a single image of each identified object utilizing selection criteria; save the selected image of each identified object; and discard and not save detected images other than said selected image of each identified object." Seeley et al does not teach automatic selection of one image of an object for

storage with the other images discarded. Instead, Seeley et al teaches at column 6, lines 7 to 11, column 12, line 66 to column 13, line 2 and column 14, lines 50 to 54 transmission of video snapshots at predetermined intervals once an intrusion is detected. Seeley et al further teaches at column 15, lines 19 to 22 and lines 51 to 53 storage of all these images. Accordingly, claims 1, 22, 25 and 29 are allowable over Seeley et al.

Claim 3 recites subject matter not anticipated by Seeley et al. Claim 3 recites the image selection process uses "image selection criteria which are intended to lead to the selection of an image in which the face of a detected person is visible and large." The Applicant respectfully submits that Seeley et al includes no teaching of attempting to detect a "visible and large" image of a person's face. Accordingly, claim 3 is allowable over Seeley et al.

Claim 4 recites subject matter not anticipated by Seeley et al. Claim 4 recites "selecting the selected image for the given change region by discarding images from the set in which a lowermost side of the bounding box is higher than in other images of the set, and by selecting from the remaining images of the set an image in which a size of the bounding box is larger than in the other remaining images of the set." The Applicant respectfully submits that Seeley et al includes no teaching regarding the lowermost side or the size of a bounding box for a given change region. Accordingly, claim 4 is allowable over Seeley et al.

Claim 5 recites subject matter not anticipated by Seeley et al. Claim 5 recites the automatic selecting uses "image selection criteria which cause a current image to be selected over a prior image if a lowermost point of a detected change region is lower in the current image than in the prior image." The Applicant respectfully submits that Seeley et al includes no teaching

regarding the lowermost point of a detected change region. Accordingly, claim 5 is allowable over Seeley et al.

Claim 6 recites subject matter not anticipated by Seeley et al. Claim 6 recites the automatic selecting uses "image selection criteria which cause a current image to be selected over a prior image if a detected change region has increased in size relative to a prior image." The Applicant respectfully submits that Seeley et al includes no teaching regarding the size of a detected change region. Accordingly, claim 6 is allowable over Seeley et al.

Claim 7 recites subject matter not anticipated by Seeley et al. Claim 7 recites "said selecting step is carried out in response to the occurrence of a predefined event." Seeley et al discloses detection of intrusion events. Seeley et al fails to disclose selecting which images to store based upon such a detected event. Accordingly, claim 7 is allowable over Seeley et al.

Claims 10, 13 and 14 recite events not anticipated by Seeley et al. Claim 10 recites "an object has remained within a predefined region of the area for a specified time interval." Claim 13 recites "a determination of whether a detected object is a person." Claim 14 recites "for a detected object which is not a person, classification of the detected object into one of a plurality of predetermined categories." While Seeley et al teaches detection of intrusion events within the video sequence, Seeley et al fails to teach these events. Accordingly, claims 10, 13 and 14 are allowable over Seeley et al.

Claim 15 recites subject matter not anticipated by Seeley et al. Claim 15 recites "determining a bounding box with just large enough to completely contain the detected object and saving a portion of a detected image which includes the detected object corresponding to the bounding box." Seeley et al fails to teach saving a portion of a detected image using a bounding box. Accordingly, claim 15 is allowable over Seeley et al.

Claim 16 recites subject matter not anticipated by Seeley et al. Claim 16 recites "saving the bounding box enclosing the selected image at a second resolution which is higher than the first resolution." Seeley et al does disclose image data at full resolution and thumbnail or abbreviated snapshots. Seeley et al fails to teach that any image saved is limited to the bounding box enclosing an identified object. Accordingly, claim 16 is allowable over Seeley et al.

Claim 17 recites subject matter not anticipated by Seeley et al. Claim 17 recites "displaying the reference image at the first resolution, displaying the bounding box enclosing the selected image within the reference image at the first resolution, and displaying the bounding box enclosing the selected image separately from the reference image and at the second resolution." This subject matter is described in the application at page 19, lines 24 to 37, page 20, lines 20 to 29 and illustrated in Figure 8. Seeley does teach display of the same image data in full resolution or in thumbnail resolution. However, Seeley et al teaches this with regard to entire frames and not limited to the bounding box enclosing an identified object. Seeley et al also fails to teach that the bounding box is displayed within a reference image. Accordingly, claim 17 is allowable over Seeley et al.

Claims 25 and 29 recite further subject matter not anticipated by Seeley et al. Claim 25 recites "automatically saving information which identifies the path of movement of the object, said information being retained after the object is no longer present in newly detected images." Claim 29 similarly recites the image processing section operates to "automatically save information which identifies the path of movement of the object, and to retain the information after the object ceases to be present in current detected images." The Applicant respectfully submits that Seeley et al fails to teach saving this motion track

information. Accordingly, claims 25 and 29 are allowable over Seeley et al.

Claims 26 and 27 recite subject matter not anticipated by Seeley et al. Claims 26 and 27 each recite "saving one of the detected images of the area as a reference image, displaying the reference image, and displaying on the reference image the path of movement of the object." Seeley et al fails to teach display of the path of movement on a reference image. Accordingly, claims 26 and 27 are allowable over Seeley et al.

Claim 27 recites further subject matter not anticipated by Seeley et al. Claim 27 recites "saving an identification of an event associated with the detected object" and "displaying on the reference image the identification of the event." Seeley et al does not teach displaying the identification of an event on a reference image. Accordingly, claim 27 is allowable over Seeley et al.

Claims 26, 27 and 55 (claiming subject matter previously recited in canceled claim 30) were rejected under 35 U.S.C. 103(a) as made obvious by the combination of Seeley et al U.S. Patent No. 6,069,655 and of Baxter U.S. Patent No. 5,966,074.

Claims 26, 27 and 55 recite subject matter not made obvious by the combination of Seeley et al and Baxter. Claims 26 and 27 recite "saving one of the detected images of the area as a reference image, displaying the reference image, and displaying on the reference image the path of movement of the object." Claim 55 similarly claims the image processor operates to "save one of the detected images as a reference image; and display via said display device said reference image and said path of movement of the object within said reference image." Figure 11 of Baxter illustrates display of an object path on a plan view of a region. This display illustrated in Figure 11 of Baxter is clearly not displayed on the

reference image. Accordingly, claims 26, 27 and 55 are allowable over the combination of Seeley et al and Baxter.

Claim 27 recites further subject matter not made obvious by the combination of Seeley et al and Baxter. Claim 27 recites "saving an identification of an event associated with the detected object" and "displaying on the reference image the identification of the event." This subject matter is disclosed in the application at page 20, lines 7 to 19 and illustrated in Figure 8. Note the ENTER label 116 and EXIT label 117. Neither Seeley et al nor Baxter include any teaching regarding display of event labels on a reference image. Thus claim 27 is allowable over the combination of Seeley et al and Baxter.


New claims 40 to 54 correspond to respective claims 3 to 17 except they are dependent upon apparatus claim 22. New claims 55 and 56 correspond to respective claims 26 and 27 except they are dependent upon apparatus claim 29. New claims 40 to 56 are allowable for the reasons their respective corresponding claims 3 to 17, 26 and 27 are allowable.

The Applicants respectfully submit that all the present claims are allowable for the reasons set forth above. Therefore early reconsideration and advance to issue are respectfully requested.

If the Examiner has any questions or other correspondence regarding this application, Applicants request that the Examiner contact Applicants' attorney at the below listed telephone number and address to facilitate prosecution.


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MAILING CERTIFICATE
Under 37 C.F.R. 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on May 15, 2002.


Robert D. Marshall, Jr.
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Note inserted text is marked by underlining and deleted text is marked by ~~strikeout~~.

In the Claims

Please amend the claims as follows:

1 1. (Amended) A method of monitoring an area, comprising the
2 steps of:
3 periodically detecting an image of the area;
4 identifying and tracking a moving object in a succession of
5 the detected images;
6 automatically selecting ~~an~~ a single image of each identified
7 object using selection criteria; ~~and~~
8 saving the selected image of each identified object; and
9 discarding and not saving detected images other than said
10 selected image of each identified object.

Cancel claim 2.

1 15. (Amended) A method according to Claim 1, wherein said
2 saving step is carried out by determining a bounding box with just
3 large enough to completely contain the detected object and saving a
4 portion of a detected image which includes the detected object
5 corresponding to the bounding box.

1 16. (Amended) A method according to Claim 15, including the
2 step of saving one of the detected images as a reference image at a
3 first resolution, and wherein said step of saving the selected
4 image is carried out by saving the bounding box enclosing the

5 selected image at a second resolution which is higher than the
6 first resolution.

1 17. (Amended) A method according to Claim 1, including the
2 step of saving one of the detected images as a reference image
3 having a first resolution, wherein said step of saving the selected
4 image is carried out by determining a bounding box with just large
5 enough to completely contain the detected object and saving at a
6 second resolution a portion of a detected image which includes the
7 detected change region corresponding to the bounding box, the
8 second resolution being greater than the first resolution, and
9 including the step of displaying the reference image at the first
10 resolution, displaying the bounding box enclosing the selected
11 image within the reference image at the first resolution, and
12 displaying the bounding box enclosing the selected image separately
13 from the reference image and at the second resolution.

Cancel claims 18 to 21.

1 22. (Amended) An apparatus for monitoring an area,
2 comprising:
3 a detector which is operative to periodically detect an image
4 of the area; and
5 an image processing section which is responsive to the
6 detector, said image processing section being operative to:
7 identify and track a moving object in a succession of the
8 detected images;
9 automatically select ~~an~~ a single image of each identified
10 object utilizing selection criteria; ~~and~~
11 save the selected image of each identified object; and
12 discard and not save detected images other than said
13 selected image of each identified object.

Cancel claims 23 and 24.

1 25. (Amended) A method of monitoring an area, comprising the
2 steps of:
3 periodically detecting an image of the area;
4 identifying and tracking a moving object in a succession of
5 the detected images; ~~and~~
6 automatically selecting a single image of each identified
7 object using selection criteria;
8 saving the selected image of each identified object; and
9 discarding and not saving detected images other than said
10 selected image of each identified object; and
11 automatically saving information which identifies the path of
12 movement of the object, said information being retained after the
13 object is no longer present in newly detected images.

1 26. (Amended) A method according to Claim 25, including the
2 steps of saving one of the detected images of the area as a
3 reference image, displaying the ~~detected image which was saved~~
4 reference image, and displaying on the ~~displayed~~ reference image
5 the path of movement of the object.

1 27. (Amended) A method according to Claim 25, including the
2 steps of saving an identification of an event associated with the
3 detected object, saving one of the detected images as a reference
4 image, displaying the ~~detected image which was saved~~ reference
5 image, displaying on the ~~displayed~~ reference image the path of
6 movement of the object, and displaying on the ~~displayed~~ reference
7 image the identification of the event.

Cancel claim 28.

1 29. (Amended) An apparatus for monitoring an area,
2 comprising:

3 a detector which is operative to periodically detect an image
4 of the area; and

5 an image processing section which is responsive to the
6 detector and which is operative to:

7 identify and track a moving object in a succession of the
8 detected images; and

9 automatically select a single image of each identified
10 object utilizing selection criteria;

11 save the selected image of each identified object; and
12 discard and not save detected images other than said
13 selected image of each identified object; and

14 automatically save information which identifies the path
15 of movement of the object, and to retain the information after
16 the object ceases to be present in current detected images.

Cancel claims 30 to 39.

Please add claims 40 to 57 as follows:

1 40. (New) An apparatus according to Claim 22, wherein:

2 said image processing section being further operative to:

3 use image selection criteria which are intended to lead
4 to the selection of an image in which the face of a detected
5 person is visible and large.

1 41. (New) An apparatus according to Claim 40, wherein:

2 said image processing section being further operative to:

3 save one of the detected images as a reference image;
4 identify a moving object by evaluating images detected
5 subsequent to the reference image in order to identify therein

6 each change region where the evaluated image differs from the
7 reference image;

8 determine a bounding box for a given change region in
9 each image of a set of images in which the given change region
10 appears; and

11 select the selected image for the given change region by
12 discarding images from the set in which a lowermost side of
13 the bounding box is higher than in other images of the set,
14 and by selecting from the remaining images of the set an image
15 in which a size of the bounding box is larger than in the
16 other remaining images of the set.

1 42. (New) An apparatus according to Claim 22, wherein:
2 said image processing section being further operative to:

3 automatically select an image using image selection
4 criteria which cause a current image to be selected over a
5 prior image if a lowermost point of a detected change region
6 is lower in the current image than in the prior image.

1 43. (New) An apparatus according to Claim 42, wherein:
2 said image processing section being further operative to:

3 automatically select an image out using image selection
4 criteria which cause a current image to be selected over a
5 prior image if a detected change region has increased in size
6 relative to a prior image.

1 44. (New) An apparatus according to Claim 22, wherein:
2 said image processing section being further operative to:

3 select an image in response to the occurrence of a
4 predefined event.

1 45. (New) An apparatus according to Claim 44, wherein:
2 said image processing section wherein:

3 said predefined event includes detection of a previously
4 undetected object.

1 46. (New) An apparatus according to Claim 44, wherein:
2 said image processing section wherein:

3 said predefined event includes detection of the absence
4 of a previously detected object.

1 47. (New) An apparatus according to Claim 44, wherein:
2 said image processing section wherein:

3 said predefined event includes detection of a situation
4 in which an object has remained within a predefined region of
5 the area for a specified time interval.

1 48. (New) An apparatus according to Claim 44, wherein:
2 said image processing section wherein:

3 said predefined event includes a determination that a
4 previously moving object has become stationary.

1 49. (New) An apparatus according to Claim 44, wherein:
2 said image processing section wherein:

3 said predefined event includes a determination a
4 previously stationary object has started moving.

1 50. (New) An apparatus according to Claim 44, wherein:
2 said image processing section wherein:

3 said predefined event includes a determination of whether
4 a detected object is a person.

1 51. (New) An apparatus according to Claim 50, wherein:
2 said image processing section wherein:

3 said predefined event further includes, for a detected
4 object which is not a person, classification of the detected
5 object into one of a plurality of predetermined categories.

1 52. (New) An apparatus according to Claim 22, wherein:
2 said image processing section being further operative to:

3 save said selected image by determining a bounding box
4 with just large enough to completely contain the detected
5 object and saving a portion of a detected image which includes
6 the detected object corresponding to the bounding box.

1 53. (New) An apparatus according to Claim 52, wherein:
2 said image processing section being further operative to:

3 save one of the detected images as a reference image at a
4 first resolution; and

5 save the selected image by saving a bounding box
6 enclosing the selected image at a second resolution which is
7 higher than the first resolution.

1 54. (New) An apparatus according to Claim 22, further
2 comprising:

3 a display device; and

4 wherein said image processing section being connected to the
5 display device and being further operative to:

6 save one of the detected images as a reference image
7 having a first resolution;

8 save the selected image by saving a bounding box
9 enclosing the detected object and saving at a second
10 resolution which is higher than the first resolution;

11 display via said display device said reference image at
12 the first resolution and said bounding box within said
13 reference image at said first resolution, and
14 display via said display device said bounding box
15 separately from said reference image and at said second
16 resolution.

1 55. (New) An apparatus according to Claim 29, further
2 comprising:

3 a display device; and

4 wherein said image processing section being connected to said
5 display device and being further operative to:

6 save one of the detected images as a reference image; and
7 display via said display device said reference image and
8 said path of movement of the object within said reference
9 image.

1 56. (New) An apparatus according to Claim 25, further
2 comprising:

3 a display device;

4 wherein said image processing section being connected to said
5 display device and being further operative to:

6 save an identification of an event associated with said
7 detected object;

8 save one of the detected images as a reference image; and
9 display via said display device said reference image,
10 said path of movement of the object within said reference
11 image, and said identification of said event on said reference
12 image.